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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,927	01/24/2002	Brian S. McDower		4017

7590 09/27/2004
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EXAMINER

MAYES, MELVIN C

ART UNIT PAPER NUMBER

1734

DATE MAILED: 09/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/056,927	MEDOWER ET AL.	
	Examiner	Art Unit	
	Melvin Curtis Mayes	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

(1)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(2)

Claims 9 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "the etching." There is insufficient antecedent basis for this limitation in the claim. Etching is claimed in Claim 6.

Claim 23 recites the limitation "the bumps." There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

(3)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1734

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(4)

Claims 1-4, 6-9, 12, 14-22 and 24-31 rejected under 35 U.S.C. 103(a) as obvious over Masuhara 6,440,333 in view of Pan 4,960,680.

Masuhara discloses a method of making an optical disc substrate having a pattern of grooves and pits and lands comprising: forming a photoresist layer on a glass substrate; spinning the glass substrate and exposing predetermined areas of the photoresist to laser to pattern the resist layer; removing the exposed areas to form a glass master having depressions, projections and lands; plating the master with nickel; separating the nickel layer from the master to form a master stamper (father stamper) having an inverted pattern of the depressions and projections

Art Unit: 1734

formed on the glass master; plating the father stamper with nickel to form a nickel layer; separating the nickel layer to form a mother stamper having an inverted pattern of the depressions and projections formed on the father stamper and thus the same pattern of depressions and projections as formed on the glass master; using the mother stamper with an injection molding machine to form an optical disc substrate from a resin such as polycarbonate, the optical disc having a pattern of grooves (bumps), pits and lands formed between the grooves; forming a recording layer of a phase change material on the optical disc substrate; and forming a dielectric layer over the phase-change recording layer. Writing light is irradiated to write a signal on the main surface of the land of the optical disc, and the recording mark formed on the main surface of the land of the optical disc is read by irradiating a reading light to the land. Masuhara discloses that write-once optical discs have signals written on the recoding layer formed on the grooves and/or lands (col. 1-17). Masuhara does not disclose that the phase change material is one whose optical phase changes in a positive direction from a first state to a second state after being written to (i.e., from amorphous to crystalline).

Pan et al. teach that for optical recording elements, write-once optical recording layers which possess crystallization rate less than 1.0 microseconds, good corrosion resistance, stable amorphous state and capability of high rate and high density recordings comprise an alloy of antimony, indium and tin of particular compositions. Recordings on the layer are made using the amorphous to crystalline transition mechanism (col. 2, line 47 – col. 3, line 39).

It would have been obvious to one of ordinary skill in the art to have modified the method of Masuhara for making an optical disc having a pattern of grooves and pits and lands by forming on the polycarbonate disc substrate a phase-change material of antimony-indium-tin

Art Unit: 1734

(SbInSn) alloy of particular composition, as taught by Pan et al., to form a write-once optical disc having a recording layer which possesses crystallization rate less than 1.0 microseconds, good corrosion resistance, stable amorphous state and capability of high rate, high density recordings. By providing the phase-change recording layer as SbInSn alloy, as taught by Pan et al., to form a write-once optical disc on which the recording layer is formed on the lands of the disc, as disclosed by Masuhara, phase-change material provided on the lands is one whose optical phase changes in a positive direction from amorphous when formed on the lands to crystalline after being written to, as claimed.

By forming a dielectric layer over the phase-change SbInSn alloy recording layer, a protective layer is formed over the recording layer, as claimed in Claim 12.

(5)

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuhara 6,440,333 in view of Pan 4,960,680 as applied to claim 4 above, and further in view of Dobbin RE 34,506.

Dobbin teaches that for manufacturing an optical disc master, an alternative to the photoresist mastering system, involves the use of a material which undergoes ablation when exposed to a laser, the advantages over the photoresist process including reduction in process steps such as curing (exposing) and developing (etching) which results in less costly procedure and shorter completion time (col. 2, lines 23-50).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined by providing the master with depressions and projections by using a material which undergoes laser ablation instead of using a photoresist which

Art Unit: 1734

undergoes exposing and etching, as taught by Dobbin, to reduce process steps which results in less costly procedure and shorter completion time. The use of a photoresist material which undergoes laser ablation would have been obvious to one of ordinary skill in the art as an alternative to a photoresist which undergoes laser exposing and etching to form a master with less process steps, as taught by Dobbin.

(6)

Claims 10, 11 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuhara 6,440,333 in view of Pan 4,960,680 as applied to claim 4 above, and further in view of Kerfield 6,190,838.

Kerfield 6,190,838 teaches that in making the master disk by depositing and exposing a layer of photoresist, the photoresist is deposited to form an information layer of thickness of 50-200 nm as desired according to the spin speed and photoresist solution (col. 7, lines 12-16).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined by forming on the glass substrate a photoresist layer of thickness in the range of 50-200 nm, encompassing thickness as claimed in Claims 10 and 11, as taught by Kerfield, as thickness of photoresist deposited to form an information layer on a master disk. Depositing photoresist to form a layer of thickness in the ranges of 20-120 nm or 80-90 nm as claimed would have been obvious to one of ordinary skill in the art as thickness suitable for the photoresist layer formed on a master disk for forming optical discs. By forming the photoresist layer to thickness in the range of 50-200 nm, thus encompassing 80-90 nm, as suggested by Kerfield, for forming the depressions, projections and lands on the master, the master and subsequent stampers are obviously provided with projections (bumps) having height

Art Unit: 1734

encompassing the range of 80-90 nm, as claimed in Claim 23, as the thickness of the photoresist determines the height of the projections formed by exposing and removing photoresist.

(7)

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuhara 6,440,333 in view of Pan 4,960,680 as applied to claim 1 above, and further in view of JP 3-105739 Abstract.

JP 3-105739 Abstract teaches that an optical disc having improved environmental resistance is provided with a protective film of silicon oxynitride.

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined for making an optical disc by providing the disc with a protective layer of silicon oxynitride, as taught by JP 3-105739, to improve environmental resistance of the optical disc. The use of silicon oxynitride as a protective layer on the phase-change recording layer would have been obvious to one of ordinary skill to improve environmental resistance.

Conclusion

(8)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references disclose methods of making optical disc having lands using a master and stampers.

Koshino et al. discloses using an indium-antimony-tin alloy for optical recording medium.

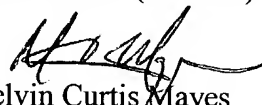
Art Unit: 1734

(9)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
September 24, 2004